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AUTHOR	Tal, Revital T.
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ABSTRACT

This paper presents a case study of school-community collaboration in an elementary community school (grades 1-6) in Israel. The development of environmental education school-based curriculum was at the core of this effort. The collaboration was established in the framework of the Community School Approach, which is practiced in many schools in Israel. In these schools, parents are encouraged to be involved in planning school-based curriculum. The idea of a community of learners (Beriter & Scardamelia, 1993; Crawford, Krajcik & Marx; Gallagher, 1989) is examined here under the perception of the school's community as a large learning community. The aim of the study was to describe school-community partnerships and to examine the advantages and limitations for community-based collaboration, emphasizing local ideas of project-based learning in environmental education (EE). The study describes an exemplary collaboration and the development of local school-community partnerships, which can be adopted and adapted by other communities within elementary or middle schools. (Contains 22 references.) (Author/YDS)

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Community-Based Science-Technology-Society Education – A Case Study

Revital T. Tal, Israel Institute of Technology, Israel
rtal@tx.technion.ac.il

The paper presents a case study of school-community collaboration in an elementary community school (grades1–6) in Israel. The development of environmental education school-based curriculum was at the core of this effort. The collaboration was established in the framework of the *Community School Approach*, which is practiced in many schools in Israel. In these schools parents are encouraged to be involved in planning school-based curriculum. The idea of community of learners (Beriter & Scardamelia, 1993; Crawford, Krajcik & Marx, 1999; Gallagher, 1989) is examined here under the perception of the school's community as a large learning community.

The aim of the study was to describe school-community partnership and examine the advantages and limitations for community-based collaboration, emphasizing local ideas of project-based learning in environmental education (EE).

The study describes an exemplary collaboration and the development of local school-community partnership, which can be adopted and adapted by other communities within elementary or middle schools.

THEORETICAL BACKGROUND

Schools should be considered legitimate in the eyes of their relevant publics. The basic community approach perceives schools as communities rather than organizations (Sergiovanni, 1994). Families, friendship networks and social clubs are examples of organized collections of people that are different from formal organizations that have defined structures. Sergiovanni based his ideas on the distinction between *gesellschaft* (society) and *gemeinschaft* (community) made by the German sociologist Tonnies in 1887. The community school approach, which relates to the relationships between families, social clubs, volunteers and individuals who share emotions and values, is based on the second (Tonnies, 1887 in Sergiovanni, 1994).

Social interaction among learners is a basic principle of social constructivism (Driver, Asoko, Leach, Mortimer & Scott, 1994; Guaskel, 1994). Dewey (1938) was the first one to emphasize learning science in a community environment, which allows the student to challenge real life problems. Vygotsky (1978) had argued that knowledge is a socially constructed entity, which is developed as a result of continuous negotiation and collaboration among individuals as part of society. Different abilities of students allow addressing out possible differences with various types of social interactions within the school. Goodlad (1984) has recommended the involvement of the broader com-

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munity in school life in order to encourage substantial educational reform. He suggested that schools encourage volunteers from all areas of life to engage in school activities. The importance of community involvement in a meaningful school reform has been emphasized in the last two decades (Fullan, 1997). A school's community, which includes parents, social institutions and municipalities, should be part of that effort. Criticism towards traditional schools often refers to the artificial learning environment, emphasizing mainly formal knowledge and skills, while neglecting other domains such as collaboration in building of community knowledge (Bereiter & Scardamalia, 1993).

In addressing the issue of community building in schools, Sergiovanni (1994) argues that "community is the tie that binds students and teachers together in special ways, to something more significant than themselves: shared values and ideals" (p.xiii). A school's community usually refers to students, teachers and faculty within the school, but also includes parents and community members. Sharan, Shachar and Levine (1999) suggest that parents' involvement in school should be above and beyond the common planning of social activities or even maintaining close relationships between teachers and parents. Schools should establish productive relationships with many different settings in the community. Municipalities, institutions and local organizations must assist in creating the legal and procedural framework needed to make students study out of the school-building a matter of routine.

Aspects of community involvement as part of the Science-Technology-Society movement include rephrasing the goals of science education (Bybee, 1993) and interaction with different stakeholders (Staley, 1993) as part of learning in "real life" environments. Gray (1984) listed nine major steps for creating school-community partnerships, including identifying needs, creating programs and implementing and evaluating them. Family involvement in school activities was found to be positive in both cognitive and affective domains (Dierking & Falk, 1994). Environmental education in particular is emphasized as being elevated by school-community partnership (Ben-Peretz, 1980; Evans et al., 1996; Gallagher et al., 2000; Wheeler et al., 1996). Learning science and technology in collaborative environments requires various levels of collaboration within the classrooms, as well with people and groups outside the classrooms (Blumenfeld et al., 1996; Crawford, Krajcik & Marx, 1999). Inquiry is one of the best paths towards creating communities of learners.

GOALS

The purposes of the study were to describe and analyze a school-community collaboration, which focuses on curricular activities, and to identify and discuss the advantages and limitations of this collaboration.

METHOD

Setting

The school described here is an elementary school (grades 1–6) with a population

of about 450 students in the north of Israel. The school serves a middle and upper-middle class community. Many of the people who moved into this community expressed their interest in influencing their children education. The schools' mission, which was developed by teachers and parents, declares that school should serve the community at large, and that its programs should reflect community issues. The school's curriculum incorporates both national mandatory subjects and local programs designed by the community. The school's resources are based on the personal and professional potential of the teachers, community institutions and the whole target population. The school represents a large stream of schools, seeks for intensive community involvement and fits the basic nature of the *Community School Approach*.

Participants

The participants in this study were parents, teachers, students and other community members who took part in various collaborative events. Interviews with twenty-five community members were conducted in two sessions. The interviewees participated in the major collaborative events and represented different age-groups and class/school activities.

Data sources and analysis

The sources of data originated from three years of participant observations in various school-community activities, and from open and semi-structured interviews with the school faculty, parents and community members, which took place during the third year. Figure 1 presents the three stages of data collection and the end product of each stage.

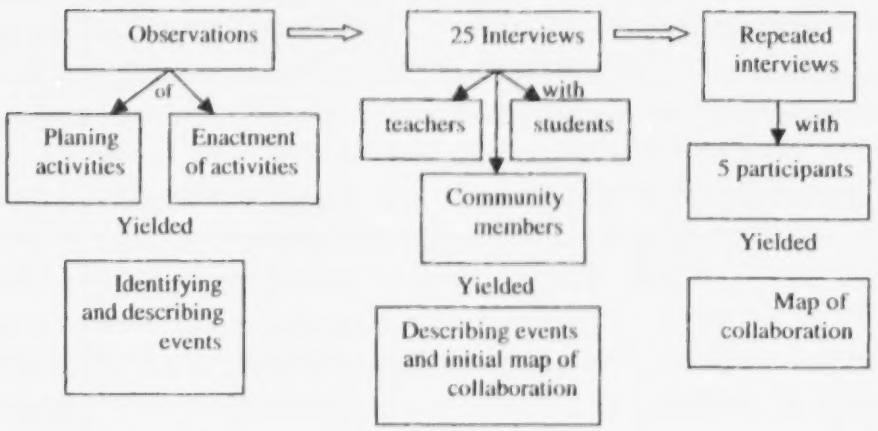

Figure 1. Structure of data collection and analysis

The observations provided the necessary knowledge about the key events and about target people for the interviews. Observing the same activities over three years permitted us to follow changes and development and to focus on these processes during the interviews. Overall, there were twenty-five interviews with teachers (5), parents (12), sixth-grade students (5) and community members (3). Each interview lasted about 30-60 minutes. Illustrative key questions were:

- Do you think that collaboration within the school community exists?
- Can you describe such collaboration/relationships?
- In what ways do you think this collaboration contributes to learning?
- Who is responsible for maintaining this collaboration?
- Do you think that parents/students/community members have the right to be involved in curricular decisions?
- Would you like to be involved in curriculum planning? Why?
- What are the limitations of this collaboration?
- Were you personally involved in school-community activities? Can you describe your role and your experience?

The main events were identified through the observations. A list of approximately ten events, which involved parents and/or community involvement, was created. The long-term observations and the first set of interviews were used for describing the events. The interviewees were asked to draw a map, which explains the relationships they found within the school and its community. The participants were asked to use only their own experience and to relate only to events in which they participated during that year. The maps were collected and analyzed relying on the observation data. Five maps were then presented at the second set of the interviews. The repeated interviews, with five representatives of different sub-groups (two teachers, two parents and one student) were used for drawing a final "map of collaboration" (see figure 3). They were asked to critique the scheme, add possible links or erase others. Findings from these repeated interviews intended to confirm, refine or reject the categories raised at the observation stage and from the first set of interviews.

FINDINGS

In this section we present a short summary of the first interview set, which focused on issues of initiatives, participation and responsibility. Then we summarize the main efforts, and finally – summarize the second set of interviews, which allowed us to draw a relationship map.

General analysis of the interviews shows that all the participants think collaboration exists. They were all able to describe at least one substantial example. There was less agreement on the issue of responsibility. Most of the teachers think it is the school's responsibility to maintain and control collaboration efforts, while some of the parents agree with the teachers and others think that it is the parents' responsibility.

All the participants thought they should be involved in curricular decisions or "macro-planing" a term that was suggested by one of the parents. Example for planning are: school projects, enrichment activities and courses. Only a minority of all the interviewees thought parents should be involved in everyday curriculum planning. Most of them acknowledged "teacher professionalism" as the main reason and many stated that although involvement in general is positive, parents have their own agenda and they cannot be committed on a regular basis. Some of the students said that they would not like their parents to become like teachers.

Detailed analysis of the observation data and the first set of interviews raised six main examples for community-school collaboration, which are presented in Table 1.

Table 1. Collaborative efforts and type of involvement

Collaborative efforts	*Type of involvement*	*No. of events*	*Duration of*
Field trips	Planning, participating, guiding	40	Usually 1 day each
Class projects	Planning, mentoring, participating	4	1–4 weeks
Annual Independence Day	Planning, participating, guiding	1	1 week
Industry-Environment project	Planning, participating, mentoring	1	8 weeks
Environmental contribution	Planning, participating	2	1 day
Teachers' professional development	Planning, mentoring	5	1day

The collaborative efforts

1. Field trips. The school's program sustains about forty-five field trips per academic year: six to ten trips per class, which relate to the science, environmental education and social studies interdisciplinary school curriculum.

Managing this complex system demands a major effort. Therefore, the school staff called for establishing a community *Environmental Education Committee*, which consists of three science and environmental education teachers and three parents who have a rich professional experience with educative field trips. The committee met three to four times a year to plan the field trips, choose nature trails, and suggest field activities. On a few occasions, the parents took an active part in conducting and guiding the actu-

al field trips with other parents, school faculty and the students. After each field trip there is a feedback discussion with the students, both teachers and students write their reflection, which are discussed at the committee meeting for future modifications.

2. Annual Independence Day activity. This activity is a whole school activity, which takes place once a year around the Independence Day of Israel. Combining the community involvement in environmental education and the intensive program of field trips had influenced teachers and parents to enact a special learning opportunity – a whole day of re-enactment of an historical event. A different historical event is chosen every year. Each event is rooted in the struggle for independence. Teachers and community members plan a set of learning activities for different class levels. Volunteer parents and teachers survey the hiking trails, learn the environment and develop suitable field activities for every class level. Each class, accompanied by parents re-enacts its part of the historic event. Then everyone joins together for a memorial ceremony. Parents and community officials are invited to take part in the activity.

3. Yearly Classroom Projects. Most of the classrooms conduct yearly projects focused on key themes, usually a part of the science curriculum. Parents are generally invited to collaborate with the school faculty in the projects. The parents' role is different in each project and so is the number of parents who are involved. In some projects, each parent supports his/her own child, while in others, volunteer parents guide teams of students. In both examples parents receive basic instruction by the teachers and collaborate with them during the various stages of the projects. Table 2 presents examples of themes for yearly projects with activities and the main concepts learned.

Table 2. Yearly class-level projects

Table 2. *Yearly class-level projects*

Grade	Theme	Activities	Concepts
2	The scientific collection	Students collect and exhibit natural scientific collections of flowers, leaves, rocks, soil, feathers etc.	Taxonomy, sorting, labeling, scientific method, presentation.
4	The olive tree	Team-inquiry focused on scientific, historical and cultural aspects of olives and the olive tree. Groups present their projects either by posters, plays or computerized presentations.	Olive orchard, oil, fat, light, nourishment, cultural/ethnic symbols.
5	Bird research	Students choose a research topic for 2 months. Birds are in the center, but the focus can be on science (ornithology), literature or culture. End of project is an exhibition, where students and families share knowledge.	Scientific research: research question, methodology, collecting data, using references, writing a report, presentation.
6	* Industry-Environment	Experiencing the manufacturing process, marketing, making environmental considerations visiting plants, writing team portfolio.	Handcraft vs. industry machines, modern design, pollution, and sustainable development.

* Is discussed in details in the next section

4. Industry-Environment Project. The Industry-Environment Project is the inclusive summary of the school-based environmental education curriculum. The project was discussed in details in previous papers (Dori & Tal, 2000; Tal, Dori & Lazarowitz, 1996; Tal, Dori & Lazarowitz, 2000). This is an eight week after school project where groups of 10 students and 2 parents are working together doing inquiry, designing and building prototypes and models of products that influence our quality of life, while applying environmental considerations.

The sixth grade science and environment school-based curriculum incorporates ancient and modern agriculture, geographical formations, industrial and environmental issues. At the center of the curriculum are an eight-week project, case studies and field trips that involve industrial, natural, environmental and societal aspects of industrial development. The community project is carried out informally after school hours.

Parents, students and teachers choose a new industry and environment related theme each year. Then student teams, guided by volunteer parents and experts, study the scientific background related to the project theme. Most of the team meetings are held during evening hours. The teachers function as participant observers and advise the mentors. Various experts from the community give guest lectures at the group meetings or to the whole student population. The final products and group portfolios are presented to the public and go through a process of community assessment.

5. Science and technology professional development. Community involvement in teachers' professional development occurs in two different ways: (1) financing informal professional activities of the teachers, and (2) providing volunteers who support science and technology education by meeting with the teachers during evening hours and helping each group of teachers according to its special needs (content knowledge, technology, etc.). "The technology experts" is a group of five community members who give continuing support to the teachers in using and implementing information technology in the classrooms. The "experts" also serve on a community committee for purchasing and upgrading the school's hardware and software.

Collaboration map

Figure 2 presents the Collaboration Map, which emerged after the first set of interviews, and was then critiqued and refined during the second set.

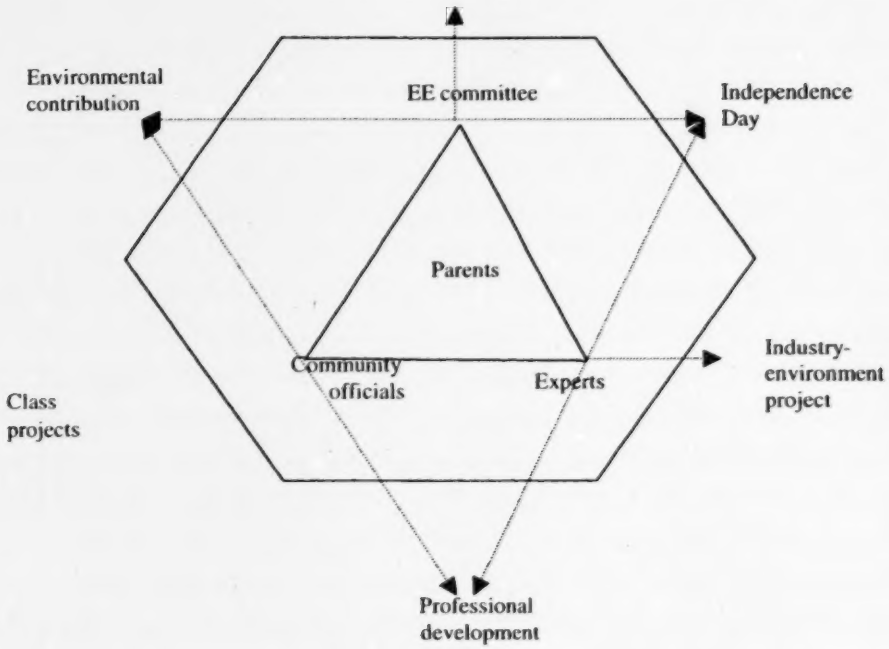

Figure 2. Collaboration map

The central triangle represents the community agents (parents, EE committee, experts and community officials) who are involved in the school. The parents who are presented in the middle are connected to all other agents and events. They are involved on all levels in the activities. The outer hexagon represents the major events. The Environmental Education committee (agent) is influential and involved in field trips, Independence Day activities and with environmental contribution activities (events). Community experts in various domains (agent) are involved with Independence Day activities, Industry-Environment Project and with professional development in the school. Community officials (i.e municipality representatives) support "environmental contribution" activities and professional development. Parents alone usually support classroom projects.

Because the community is rather small, sometimes the interviewees identified themselves in two or more sites on the map: as a parent and an expert, or as a parent, an expert and EE committee member. The following excerpts are from an interview with M' – a parent who suggested various "collaboration locations".

I had three kids in school, so I helped a group of kids who studied birds of prey with my older son (classroom project, R.T). I mentored a group of kids in the Industry

Project with my second son. I was asked to assess projects as an expert in another year, and I have been participating in the EE committee since we started it, so I guess I am everywhere on this map. Does it mean I do too much?

Another parent, T', acknowledged her contribution only as a mentor in the Industry-Environment Project. She addressed the issue of potential fatigue, and suggested another circle in the map.

The first and maybe last time I was involved, I'm joking of course, was with the Industry Project. It was so intensive and so demanding that I need sometime, before my next volunteer work at school. However, this map is not accurate enough. I attended many other activities and was aware of what was happening, but with less involvement. I would add another circle to this map, which symbolizes awareness.

Other involved parents did not agree with T'. The major claim was that parents can be either observers or participants and the aim was to draw a participation map.

The detailed description of the collaboration events allows to present the advantages and limitations of school-community collaboration as expressed by the participants.

Advantages and limitations

Although most of the interviewees in both stages spontaneously addressed pros and cons for community-school collaboration, they were requested to critique the collaboration efforts. Most of them emphasized the advantages and addressed the philosophy of the community approach. However, they all discussed disadvantages and barriers for achieving an *ideal cooperation*. A summary of the advantages and limitations of school-community collaboration, which was raised by teachers and community members, is presented in Table 3.

Table 3. Advantages and limitations of school-community collaboration

	Advantages	*Limitations*
Teachers	Greater involvement of the community in school life, support for reforms. Many more intellectual resources. Positive attitudes towards classroom experiments. Expanding the learning into "real life experiences".	Ambiguity about different roles may influence professionalism. Positive involvement may end with interfering Time consuming.
Community members	Knowing more about school. Understanding the educational language Appreciating teachers Contributing for better education. Being part of decision making.	Time consuming. "Easy solution" for complex management issues. Confuse between different roles. "Pressure" for volunteer work - you don't always want to be involved.

Two of the interviewees, a parent and a teacher discussed the pros and cons of this partnership regarding the establishment of community of learners.

Parent: *I know that sometimes I wish I could refuse a school call for partnership. I am busy with my own work, and when I come home I don't wish to work again. On the other hand, I know that my involvement causes our family to discuss schoolwork, and I'm sure it helps my kid to learn. The fact that he can share his new knowledge with us, who understand the context of the activities help him a lot. We feel that we know what he does in school, and we know what the demands and the assessments are going to be like.*

Teacher: *I expect the parents to be involved in the learning processes. I believe that parents who are more involved can help their kids better and share the same knowledge about school with them. My experience shows me that when parents and kids speak the same language either about learning or about projects and assessment, it helps a lot... I like to get parents' feedback on learning activities because these parents become part of the learning process in class.*

Although neither the teacher nor the parent used the professional term "community of learners" they both imply to the ideas of community of learners, or knowledge building communities.

Students' ideas may sometimes be different than those of the adults. Although two of the interviewed students were concerned about frequent meetings with their parents in school, others emphasized the positive aspects of parents' involvement.

SUMMARY AND DISCUSSION

Collaboration between a school and its community is subject to continuing discussion. It has clear advantages such as agreement upon educational goals and means. It also allows better management of resources (Sharan et al., 1999). Students and their families believe they are affecting the school's agenda. Parents also feel that school enhances their children's comprehensive experience in real life settings. Teachers who attempt to introduce reform feel encouraged by the community at large.

Students' achievements are an important issue that is brought to the forefront by educators as well as by community officials and politicians in many countries. Gray (1984) suggests that volunteer involvement in schools positively affects achievements, as well as the general atmosphere, which contributes to a better environment for achievements. Most of the interviewees described in this paper never raised the issue of achievements, although they addressed other learning advantages. Their perception is supported by Walberg (1984), who agrees that school-parents partnership may contribute to better achievements, but emphasizes other constructive roles of parents in school programs: parents as audience for schoolwork, tutors and co-learners. He claims that community members may contribute to school improvement much more than to achievements. In this study, both parents and students emphasized support, co-learning and shared responsibility towards school improvement.

Discomforts and sometimes frustration of partners accompany all these payoffs. These discomforts may be grouped under the title of role-play and leadership. Parents sometimes feel that they are the initiators, while teachers are not doing their job. The school's faculty may feel intimidated by various forms of parental interference. Phillips (1997) argues that although the communal organization seeks shared values and activities, positive social relations with adults in general and with teachers in particular, are hard to achieve. A possible way to discuss these discomforts would be in the context of developing discourse within learning community. Parents even addressed the development of common language as one of the advantages of this collaboration.

Lave (1988, 1991) suggested that schools fail because of creating artificial practice and environment, which is isolated from real life experiences, where people of different ages and expertise interact and solve problems. Lave perceives learning as an activity of the mind that constituted by visible social interaction that takes place among members of a community. "Cognition observed in everyday practice is distributed – stretched over, not divided among – mind, body, activity and culturally organized settings." (Lave, 1988, p.1). Bransford, Brown and Cocking (1999) address the importance of learning within communities: a family as a smaller community, which engages children in learning and acquiring skills as well as the broader community.

Connections to experts outside of school can have positive influence on in-school learning because they provide opportunities for students to interact with parents and other people who take an interest in what students are doing. It can be very motivating both to students and teachers to have opportunities to share their work with others. The intensive collaboration presented in this paper addresses both Lave's critique and Bransford's and colleagues recommendations. Accepting parents and community members as partners in the educational endeavor may contribute to better learning in real world context, and shared responsibilities in the educational process. Shulman (1997) argued that in order to promote successful collaboration both parties should see education as a systemic endeavor. In this effort disagreements and public debates may be part of any beneficial negotiation, especially when trying to establish a wide perception of the community's role in education.

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